

Chemistry Lab Report

Exp No: 05

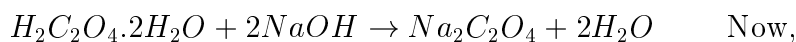
Exp Name: Standardization of supplied $NaOH$ by using $0.1M H_2C_2O_4 \cdot 2H_2O$

Equipments: 1. Burette($500mL$) 2. Conical flask($250mL$) 3. Funnel 4. Wash bottle
5. Pipette 6. Burette stand.

Theory: Titration is a common laboratory method of quantitative chemical analysis to determine the concentration of an identified analyte (a substance to be analyzed). A reagent, termed the titrant or titrator, is prepared as a standard solution of known concentration and volume. The titrant reacts with a solution of analyte to determine the analyte's concentration. The volume of titrant that reacted with the analyte is termed the titration volume.

Chemicals: 1. $NaOH$ 2. $H_2C_2O_4 \cdot 2H_2O$ 3. Distilled water 4. Indicator(Phenolphthalein).

Chemical Reaction:



$$e_1 S_1 V_1 = e_2 S_2 V_2 \Rightarrow S_2 = \frac{e_1 S_1 V_1}{e_2 V_2} \dots \dots \dots (1)$$

Where, $e_1 = 2$, $e_2 = 1$

S_1 = concentration of $H_2C_2O_4 \cdot 2H_2O$

S_2 = concentration of $NaOH$

V_1 = volume of $H_2C_2O_4 \cdot 2H_2O$

V_2 = volume of $NaOH$

Description:

- 01.** $0.1(M) H_2C_2O_4 \cdot 2H_2O$ solution preparation: Weight exactly $1.2kg$ pure crystalline oxalic by dibybrate in a $100mL$ volumetric flask. Dissolve it with little amount of distilled water and untill it up to the mark. Actually it is provided by of our lab assistant.
- 02.** Standardization of $NaOH$ solution: At first fil the burette with $NaOh$ solution and record the initial burette reading. Then take $10mL H_2C_2O_4 \cdot 2H_2O$ in conical flask and mix it up with $1/2$ drops of phenophthalein.
- 03.** Determination: Mix $NaOH$ with $H_2C_2O_4 \cdot 2H_2O$ drop by drop carefully until $H_2C_2O_4 \cdot 2H_2O$ solution changes it's color. When $H_2C_2O_4 \cdot 2H_2O$ changes it's color that means it's the end point of our titration. Now mark the reading for $H_2C_2O_4 \cdot 2H_2O$ from burette for our further calculation.

Data Table:

Burette $NaOH$ volume				
SN	$H_2C_2O_4 \cdot 2H_2O_{mL}$	$Initial_{(mL)}$	$Final_{(mL)}$	$Diff_{initial-final}$
01	$10mL$	$0mL$	$10mL$	$10mL$
02	$10mL$	$10mL$	$20.1mL$	$10.1mL$
02	$10mL$	$20.1mL$	$30.2mL$	$10.1mL$

Calculation:

From the table, Mean value of $NaOH = \frac{10+10.1+10.1}{3} = 10.07mL$

From equation (1) we get, $S_2 = \frac{e_1 S_1 V_1}{e_2 V_2} = \frac{2 \times 10 \times 0.1}{1 \times 10.07} = 0.199 \text{ M}$

Result: The concentration of $NaOH$ is **0.199 M**

Discussion: The concentration of $NaOH$ may not be totally correct for same certain chemical fault.

Precaution:

- 01.** Usually an air bubble is present in the nozzle of the burette. It must be removed before taking the initial reading.
- 02.** There should not be any kind of leakage from the burette during titration.
- 03.** Always add acid to water.
- 04.** Don't let base level in burette to reach zero.